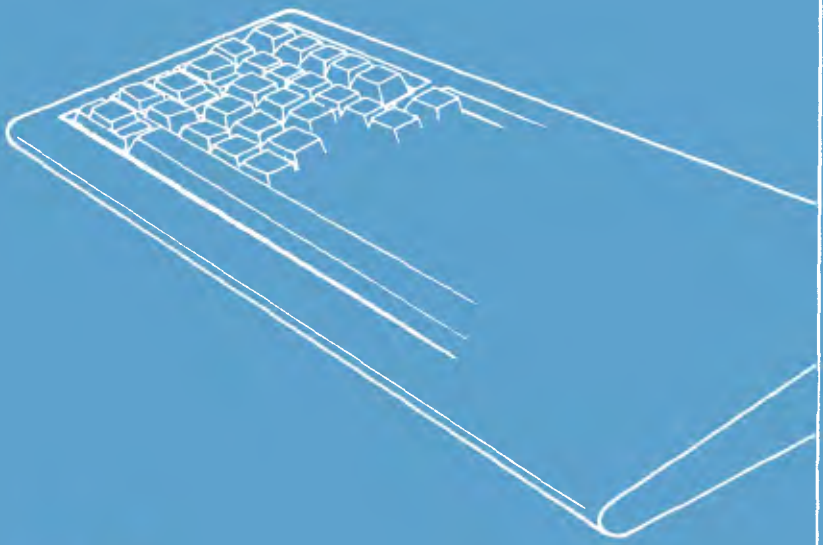
MULTI-COMPATIBLE KEYBOARD USER'S MANUAL



K7S

Simple-Functions

TABLE of CONTENTS

* IBM is a registered trademark of
International Business Machines Corporation.

Chapter 1

OVERVIEW

The "Multi-Compatible" Keyboard has seven outstanding features as follows.

1. Both Apple-II and IBM PC/PCXT plug-compatible.

2. Serial output 128 ASCII code/83 scan code.

3. Low-profile design, DIN standard.

4. Double-shoot step-sculpture keytops.

5. Cursor control code at Numeric Pad.

6. IBM PC AT Keyboard look-like improved keytop layout.

7. Concealed height adjustable tilts (Fig. 1-2).

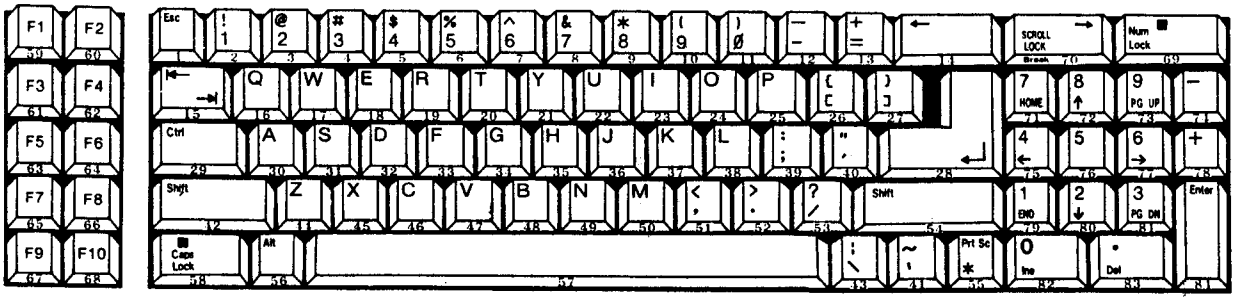
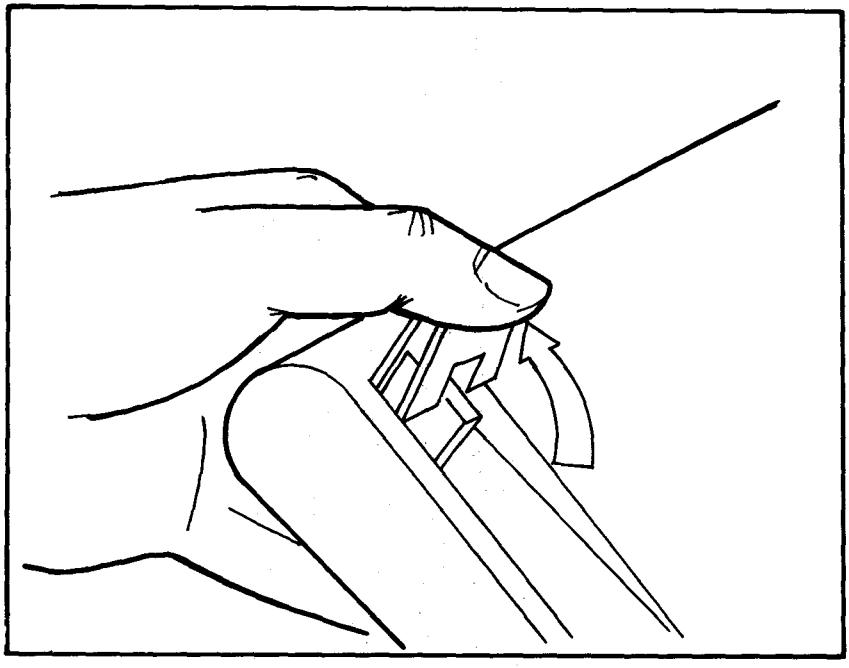


Fig. 1-1. Multi-Compatible Keyboard Layout.



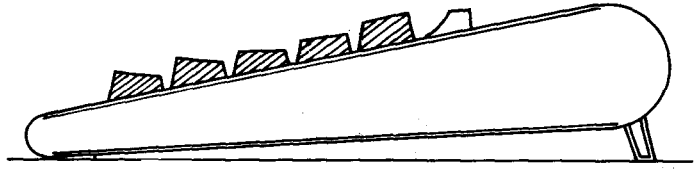


Fig. 1-2. Tilt Positions Adjustment

Chapter 2

TECHNICAL INTRODUCTION

The Multi-compatible keyboard interface is defined so that system software has maximum flexibility in defining certain keyboard operations. This is accomplished by having the keyboard return scan codes rather than American Standard Code for Information Interchange (ASCII) codes. In addition, all keys are typematic and generate both a make and a break scan code. For example, key "I" produces scan code hex 01 on make and code hex 81 on break. Break codes are formed by adding hex 80 to make codes. The keyboard I/O driver can define keyboard keys as shift keys or typematic, as required by the application.

The microcomputer in the keyboard performs several functions, including a power-on self-test when requested by the system unit. This test checks the microcomputer ROM, tests memory, and checks for stuck keys. Additional functions are: keyboard scanning, buffering of up to 8 key scan codes, maintaining bidirectional serial communications with the system unit, and executing the hand-shake protocol required by each scan-code transfer.

Chapter 3

KEYBOARD LAYOUT

The Multi-Compatible" keyboard has 84 keys arranged in three major groupings. The central portion of the keyboard is a standard typewriter keyboard layout. On the left side are 1Ø function keys. These keys are user-defined by the software. On the right is a 16-key keypad. These keys are also defined by the software, but have legends for the functions of numeric entry, cursor control, calculator pad, and screen edit. The "Enter" key is a equivalent to "  " key.

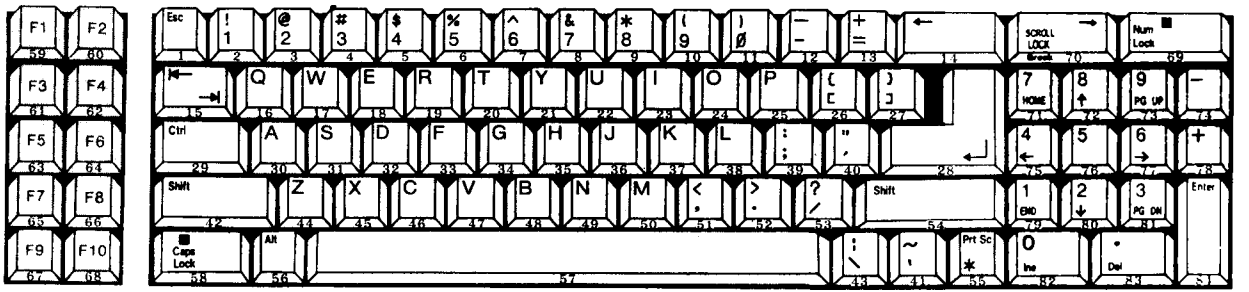
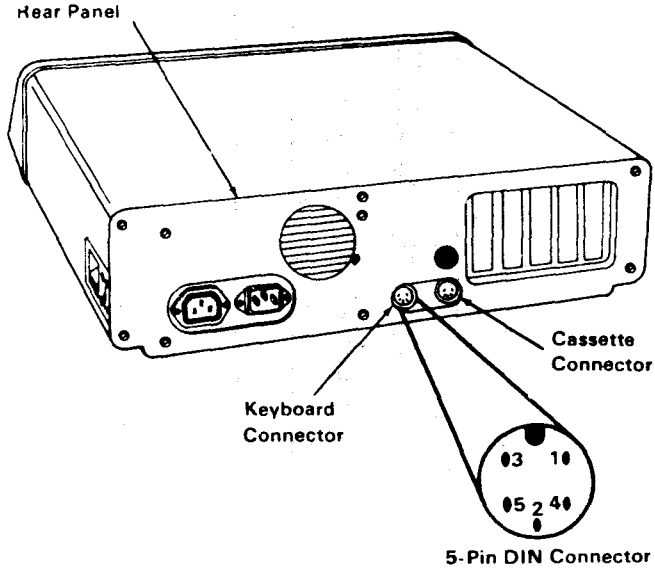


Fig. 3-1. Keyboard Layout.

Chapter 4

CONNECT TO IBM PC/PCXT



Pin	TTL Signal	Signal Level
1	+Keyboard Clock	+5 VDC
2	-Keyboard Data	+5 VDC
3	-Keyboard Reset (Not used by keyboard)	
	Power Supply Voltages	**Voltage**
4	Ground	0
5	+5 Volts	+5 VDC

Fig. 4-1. Keyboard Interface Connector Specifications.

Chapter 5

KEYCODE TABLE

Keyboard Encoding

Key Number	Base Case	Upper Case	Ctrl	Alt
1	Esc	Esc	Esc	-1
2	1	!	-1	Note 1
3	2	@	Nul (000) Note 1	Note 1
4	3	#	-1	Note 1
5	4	$	-1	Note 1
6	5	%	-1	Note 1
7	6	^	RS (030)	Note 1
8	7	&	-1	Note 1
9	8	*	-1	Note 1
10	9	(	-1	Note 1
11	0	)	-1	Note 1
12	-	_	US (031)	Note 1
13	=	+	-1	Note 1
14	Backspace (008)	Backspace (008)	Del (127)	-1
15	→| (009)	|← (Note 1)	-1	-1
16	q	Q	DC1 (017)	Note 1
17	w	W	ETB (023)	Note 1
18	e	E	ENQ (005)	Note 1
19	r	R	DC2 (018)	Note 1
20	t	T	DC4 (020)	Note 1
21	y	Y	EM (025)	Note 1
22	u	U	NAK (021)	Note 1
23	i	I	HT (009)	Note 1
24	o	O	SI (015)	Note 1
25	p	P	DLE (016)	Note 1
26	[	{	Esc (027)	-1
27	]	}	GS (029)	-1
28	CR	CR	LF (010)	-1
29 Ctrl	-1	-1	-1	-1
30	a	A	SOH (001)	Note 1
31	s	S	DC3 (019)	Note 1
32	d	D	EOT (004)	Note 1
33	f	F	ACK (006)	Note 1
34	g	G	BEL (007)	Note 1
35	h	H	BS (008)	Note 1
36	j	J	LF (010)	Note 1
37	k	K	VT (011)	Note 1
38	l	L	FF (012)	Note 1
39	;	:	-1	-1
40	'	"	-1	-1
41	`	~	-1	-1
42 Caps Lock				
43 Shift	-1	-1	-1	-1
44	z	Z	SUB (026)	Note 1
45	x	X	CAN (024)	Note 1
46	c	C	ETX (003)	Note 1
47	v	V	SYN (022)	Note 1

Keyboard Encoding(Continued)

Key Number	Base Case	Upper Case	Ctrl	Alt
48	b	B	STX (002)	Note 1
49	n	N	SO (014)	Note 1
50	m	M	CR (013)	Note 1
51	,	<	-1	-1
52	.	>	-1	-1
53	/	?	-1	-1
54 Shift	-1	-1	-1	-1
55	\	¦	FS (028)	-1
56 Alt	-1	-1	-1	-1
57	SP	SP	SP	SP
58 Ctrl	-1	-1	-1	-1
59	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
60	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
61	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
62	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
63	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
64	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
65	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
66	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
67	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
68	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)	Nul (Note 1)
69 Num Lock	-1	-1	Pause (Note 2)	-1
70 Scroll Lock	-1	-1	Break (Note 2)	-1

Key Number	Num Lock	Base Case	Alt	Ctrl
71	7	Home (Note 1)	-1	Clear Screen
72	8	↑ (Note 1)	-1	-1
73	9	Page Up (Note 1)	-1	Top of Text and Home
74	-	.....	-1	-1
75	4	← (Note 1)	-1	Reverse Word (Note 1)
76	5	-1	-1	-1
77	6	→ (Note 1)	-1	Advance Word (Note 1)
78	+	+	-1	-1
79	1	End (Note 1)	-1	Erase to EOL (Note 1)
80	2	↓ (Note 1)	-1	-1
81	3	Page Down (Note 1)	-1	Erase to EOS (Note 1)
82	0	Ins	-1	-1
83		Del (Notes 1,2)	Note 2	Note 2
84	"Enter" (Equivalent to CR)			

Notes: 1. Refer to "Extended Codes" in this section.
2. Refer to "Special Handling" in this section.

Extened Codes

Second Code	Function
3	Nul Character
15	⟵
16-25	Alt Q, W, E, R, T, Y, U, I, O, P
30-38	Alt A, S, D, F, G, H, J, K, L
44-50	Alt Z, X, C, V, B, N, M
59-68	F1 to F10 Function Keys Base Case
71	Home
72	↑
73	Page Up and Home Cursor
75	⟵
77	⟶
79	End
80	↓
81	Page Down and Home Cursor
82	Ins (Insert)
83	Del (Delete)
84-93	F11 to F20 (Upper Case F1 to F10)
94-103	F21 to F30 (Ctrl F1 to F10)
104-113	F31 to F40 (Alt F1 to F10)
114	Ctrl PrtSc (Start/Stop Echo to Printer)
115	Ctrl ⟵ (Reverse Word)
116	Ctrl ⟶ (Advance Word)
117	Ctrl End [Erase to End of Line (EOL)]
118	Ctrl PgDn [Erase to End of Screen (EOS)]
119	Ctrl Home (Clear Screen and Home)
120-131	Alt 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, -, = (Keys 2-13)
132	Ctrl PgUp (Top 25 Lines of Text and Home Cursor)

Chapter 6
KEYBOARD USAGE

This section is inteded to outline a set of guidelines of key usage when performing commonly used functions.

Function	Key(s)	Comment
Home Cursor	Home	Editors; word processors
Return to outermost menu	Home	Menu driven applications
Move cursor up	↑	Full screen editor, word processor
Page up, scroll backwards 25 lines and home	PgUp	Editors; word processors
Move cursor left	← Key 75	Text, command entry
Move cursor right	→	Text, command entry
Scroll to end of text Place cursor at end of line	End	Editors; word processors
Move cursor down	↓	Full screen editor, word processor
Page down, scroll forward 25 lines and home	Pg Dn	Editors; word processors
Start/Stop insert text at cursor, shift text right in buffer	Ins	Text, command entry
Delete character at cursor	Del	Text, command entry
Destructive backspace	← Key 14	Text, command entry
Tab forward	→|	Text entry
Tab reverse	|←	Text entry
Clear screen and home	Ctrl Home	Command entry
Scroll up	↑	In scroll lock mode
Scroll down	↓	In scroll lock mode
Scroll left	←	In scroll lock mode
Scroll right	→	In scroll lock mode
Delete from cursor to EOL	Ctrl End	Text, command entry
Exit/Escape	Esc	Editor, 1 level of menu, and so on

Keyboard Usage (Continued)

Function	Key(s)	Comment
Start/Stop Echo screen to printer	Ctrl PrtSc (Key 55)	Anytime
Delete from cursor to EOS	Ctrl PgDn	Text, command entry
Advance word	Ctrl→	Text entry
Reverse word	Ctrl←	Text entry
Window Right	Ctrl→	When text is too wide to fit screen
Window Left	Ctrl←	When text is too wide to fit screen
Enter insert mode	Ins	Line editor
Exit insert mode	Ins	Line editor
Cancel current line	Esc	Command entry, text entry
Suspend system (pause)	Ctrl Num Lock	Stop list, stop program, and so on Resumes on any key
Break interrupt	Ctrl Break	Interrupt current process
System reset	Alt Ctrl Del	Reboot
Top of document and home cursor	Ctrl PgUp	Editors, word processors
Standard function keys	F1-F10	Primary function keys
Secondary function keys	Shift F1-F10 Ctrl F1-F10 Alt F1-F10	Extra function keys if 10 are not sufficient
Extra function keys	Alt Keys 2-13 (1-9,0,-,)	Used when templates are put along top of keyboard
Extra function keys	Alt A-Z	Used when function starts with same letter as one of the alpha keys

APPENDIX A

SPECIFICATIONS

Power Requirment +5 VDC 28ØmA

Mechanical Specifications

Keyboard Height: Home row is 29mm from top of keytop to desktop. Typing angle adjustable from 6 degrees to 12 degrees.

Total Key Travel: 4.3mm ± Ø.5mm

Activation Force: 6Ø grams ± 25 grams

Key Space Center: 19.Ømm standard

Dimensions: Keyboard: 44Ø (W) x 185 (D) x 37 (H) mm

Weight: 1.2 Kg

PACKING DATA

One set keyboard in one inner box

Dimension: 49Ø (W) x 245 (D) x 85 (H) mm

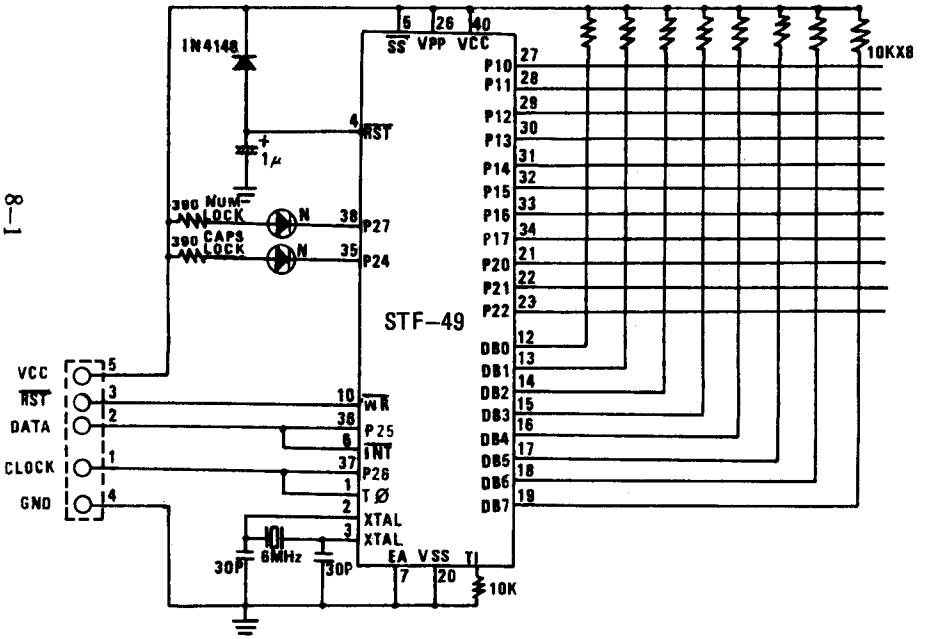
Weight: 1.6 Kg

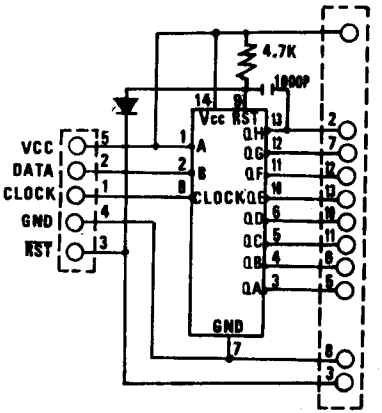
10 Boxes in one outer carton

Dimension: 515 (W) x 51Ø (D) x 445 (H) mm

Weight: 17.5 Kg

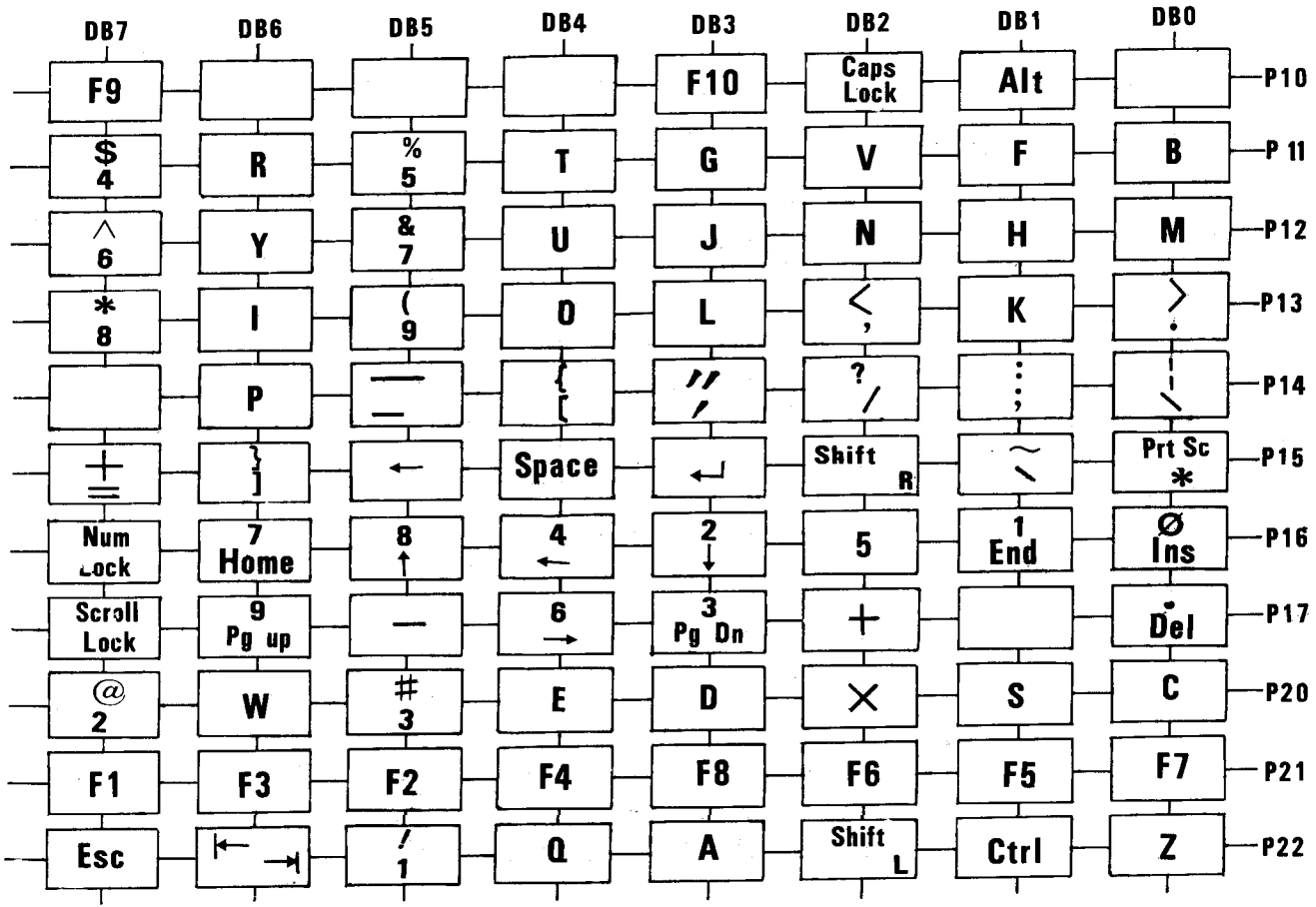
APPENDIX B
CIRCUIT DIAGRAM





OPTIONAL :

ADAPTOR FOR APPLE II


DB7
DB6
DB5
DB4
DB3
DB2
DB1
DB0
F9
F10
Caps Lock
Alt
P10
$ 4
R
% 5
T
G
V
F
B
P 11
^ 6
Y
& 7
U
J
N
H
M
P12
* 8
I
(9
O
L
K
P13
P
Space
Shift R
Prt Sc *
P14
P15
Num Lock
7 Home
8
4
2
5
1 End
Ø Ins
P16
Scroll Lock
9 Pg up
6
3 Pg Dn
Del
P17
@ 2
W
3
E
D
S
C
P20
F1
F3
F2
F4
F8
F6
F5
F7
P21
Esc
Q
A
Shift L
Ctrl
Z
P22